MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/2017

TWC3231 – MOBILE AND WIRELESS COMMUNICATIONS

(All sections / Groups)

15 October 2016
2.30 pm – 4.30 pm
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 4 pages with 6 Questions only.
2. Answer ALL questions. All Questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

QUESTION 1 [2+2+4+2 marks]

(a) Describe Mobile Network Operator (MNO).

(b) Why throughput metric is more appropriate compared to the data rate in wireless networks?

(c) Describe any FOUR functions for Serving GPRS Support Node (SGSN) that found in GPRS.

(d) Label the blanks for the table below.

Frequency	Wavelength	Name
	1 Km	
3 MHz - 30 MHz		Radio Waves
300 MHz - 3GHz	100 mm	

QUESTION 2 [2+2+2+4 marks]

(a) List FOUR issues that need to be considered in designing wireless networks

(b) Describe how TDMA is more efficient than FDMA.

(c) List TWO implications of room size and layout that can affect the performance of IR LANs.

(d) Describe FOUR possible in security issues Web Server Tier (Middle Tier).

QUESTION 3 [2+4+2+2 marks]

(a) List TWO possible roles that a Bluetooth device can be played in a piconet.

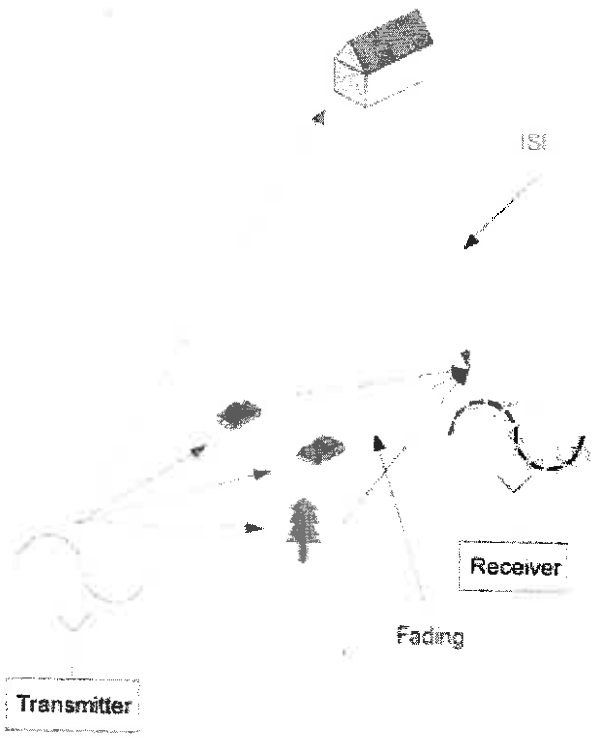
(b) Fill-in the 2 columns for IEEE 802.15.1 and IEEE 802.11b as in the table below.

Characteristic	IEEE 802.15.1	IEEE 802.11b
Spectrum		
Max Transmit Rate		
Frequency selection		
Medium access		

(c) Describe why hexagonal pattern is used in cellular network.

Continued.....

(d) Identify Inter Symbol Interference (ISI) and fading in the diagram below.



QUESTION 4 [4+2+2+2 marks]

(a) Design TWO diagrams to illustrate frequency hopping technique in Bluetooth.

(b) List FOUR approaches to cope with increasing capacity in cellular network.

(c) Design a diagram to show generation evolution of cellular networks for two major standards in the world.

(d) Explain TWO advantages of Wireless Local Loop (WLL) over wired approach.

QUESTION 5 [3+4+3 marks]

(a) Explain THREE MAC sub-layers in WIMAX

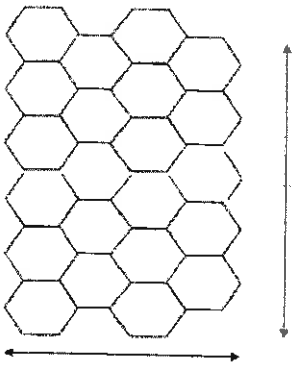
(b) Explain the location tracking approaches of a phone, besides GPS.

(c) List THREE causes that may reduce the efficiency of Free Space Optic (FSO).

Continued.....

QUESTION 6 [4+2+2+2 marks]

(a) Appraise and calculate the height and the width of the following approximate square pattern in a cellular network. The cell radius is 500 meter.



(b) Appraise and Calculate the number of channels per cell and the total number of concurrent calls that can be handled. [Assumption: The reuse factor is 10, there are 15 cells and the total frequency bandwidth is 420 traffic channels]

(c) Contrast C code and P code in GPS by its usage.

(d) Explain any TWO functionalities for mobile operating system.

End of Page